MODIS Vegetation Production and Net Primary Production (MOD 17)

Product Description

MOD 17 is a Level 4 product consisting of 8-day Net Photosynthesis (PSN) and Net Primary Production (NPP). Annual NPP is the time integral of the PSN product over a year.

Research and Applications

This product provides an accurate measure of terrestrial vegetation growth and production activity. The theoretical use is to define the seasonally dynamic flux of terrestrial-surface carbon dioxide for climate modeling. Fluxes will be computed specific to each vegetation type. The practical utility is to measure crop yield and forest production and any other socially significant products of vegetation growth. As this global NPP product becomes regularly available, a wide variety of derived products is expected to be developed making regionally specific estimates of crop production. The value of an unbiased, regular source of crop and forest production estimates for global political and economic decision making is immense.

Data Set Evolution

The NPP parameter is the yearly integral of the PSN which is obtained from the product of PAR (Photosynthetically Active Radiation), FPAR (Fraction of Photosynthetically Active Radiation) and conversion-efficiency coefficients obtained from other MODIS products and other sensors and ancillary data. The algorithms for these products are based on the original logic of Monteith (1972), which relates PSN and NPP to the amount of Absorbed Photosynthetically Active Radiation (APAR). The MODIS modified vegetation indices (MVI) along with climate variables and the land cover product are used to estimate APAR.

Suggested Reading

Field, C.B. *et al.*, 1995.

Monteith, J.L., 1972.

Prince, S.D., and S.N. Goward, 1995.

Ruimy, A. *et al.*, 1994.

Running, S.W., 1990.

Running, S.W. *et al.*, 1994.

MODIS Vegetation Production and Net Primary Production Summary

Coverage: Global

Spatial/Temporal Characteristics: 0.5, 1, 10 km/ 8-day, yearly

Key Science Applications: Interannual variability of vegetation

Key Geophysical Parameters: NPP, photosynthesis, respiration

Processing Level: 4

Product Type: Standard, at-launch

Maximum File Size: 4.3 MB

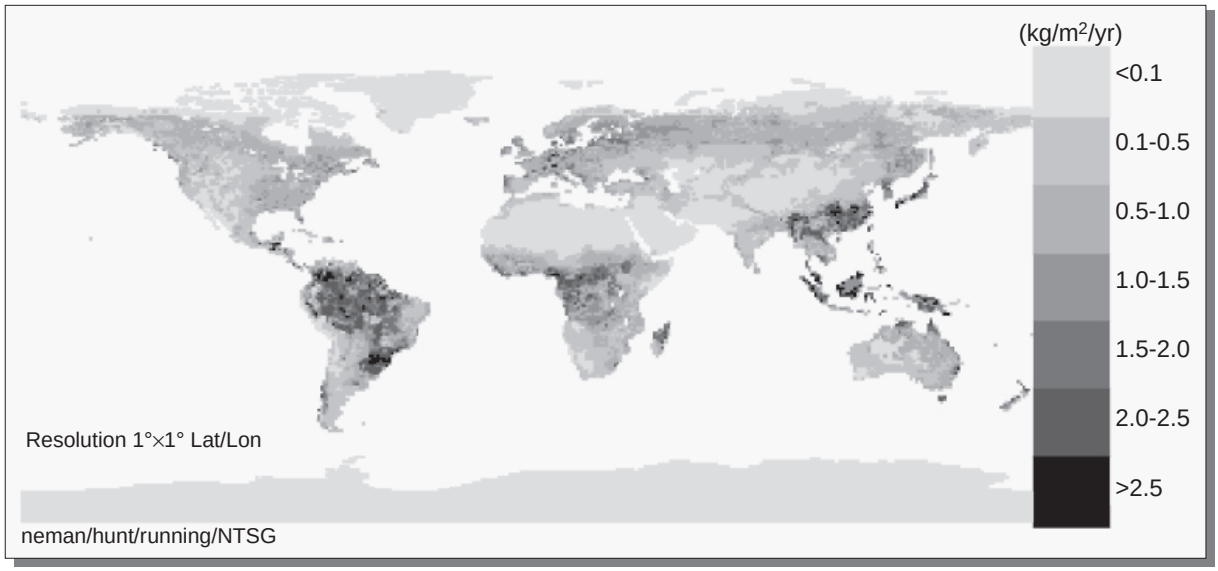
File Frequency: 289/8-day

Primary Data Format: HDF-EOS

Additional Product Information: http://modis-land.gsfc.nasa.gov/products/products.asp?ProdFamID=3

DAAC: EROS Data Center

Science Team Contact: S.W. Running



Global Net Primary Production (NPP) during 1987. This data set is produced using 1° × 1° gridded climate data from 7000 weather stations distributed globally, Mathews land cover classes collapsed into six classes, biome-specific NDVI-LAI relations used to estimate LAI from NOAA/NASA Pathfinder data, and an ecosystem simulation model, BIOME-BGC.